

Visualizing Dynamic Weather and Ocean data in Google Earth 5



What is it?

A new version of Google Earth including:

- 3D bathymetry, ocean surface, and underwater navigation
- Extensions to KML to support creation of ocean content
- 20 layers to educate users and demonstrate new features

- Also, historical imagery, Mars, and feature improvements



Why are we doing this?

Google's mission is

To organize the world's information and make it universally accessible and useful.

Google's mission is NOT

To organize 29.2% of the world's information and make it universally accessible and useful.



How are we doing?

We like numbers. Let's take a look...





5

% of the ocean that's been explored



41

of languages supported





20,000

□ points of interest in ocean layers

A decorative graphic at the top of the page features a green sphere on the left and three overlapping semi-circles in blue, red, and yellow on the right.

1,500,000

video views in *Explore the Ocean* layer

Google™

A decorative header featuring a horizontal line. Above the line, there are four overlapping spheres: a green one on the far left, and three others (blue, red, and yellow) clustered together on the right.

500,000,000

activations of Google Earth
points in bathymetry database



New Tools for Visualization

- Google Earth 5, WebKit Browser
 - Full featured HTML rendering
- Google Earth 5, New Extensions
 - Altitude Modes
 - Touring Features
 - Time

Google Earth 5 - WebKit Browser

What it supports:

- HTML
- CSS
- SVG
- Most Javascript

What it doesn't support:

- Cookies
- Doctype declarations
- Some local content (by default)

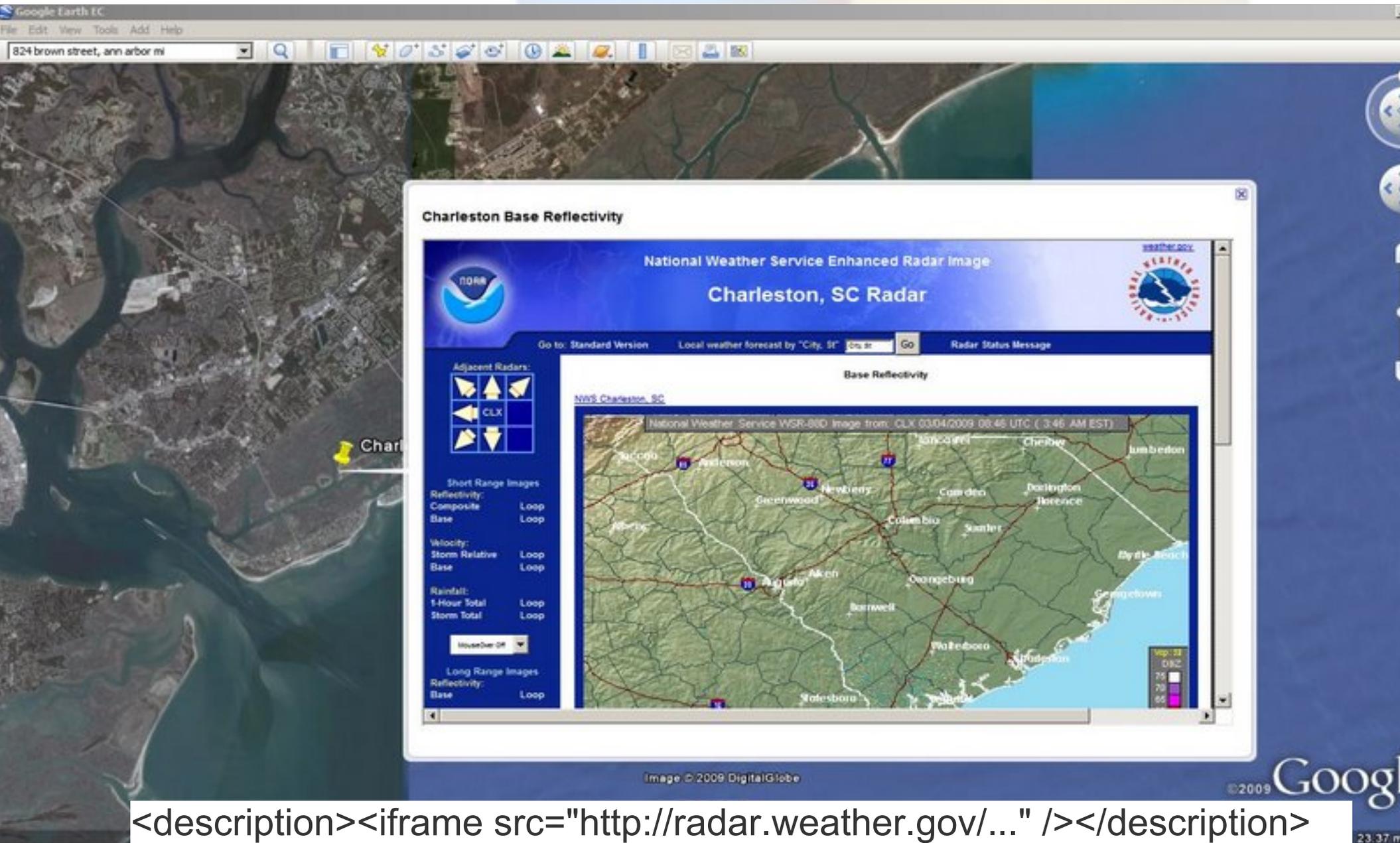


Google Earth 5 - WebKit Browser

```
<Placemark>
<name>HTML in KML</name>
<Point>
  <description>
    <html><head />
    <body>
      <iframe src="http://radar.weather.gov/..." />
    </body>
  </html></description>
  <coordinates>
    -122.5909986451928,37.74528656192857,4
  </coordinates>
</Point></Placemark>
```



Google Earth 5 - WebKit Browser



<description><iframe src="http://radar.weather.gov/..." /></description>

Google Earth 5 - WebKit Browser

Google Earth EC

File Edit View Tools Add Help

4 brown street, ann arbor mi

Ocean Observations

Recent Conditions -- Springmaid Pier, SC

Air temperature: 0.0 °C (32.0 °F)
Pressure Tendency: +0.0 hPa (0.0 in)
Sea level pressure: 1030.8 hPa (30.4 in)
Water temperature: 9.5 °C (49.3 °F)
Wind direction: 10 °True (N)
Wind gust speed: 5.7 m/s (11.1 kts)
Wind speed: 4.6 m/s (8.9 kts)
Last reported: 6:00 AM GMT 03/04/2009
1:00 AM EST 03/04/2009

Air temperature (Degrees F)

38.40
24.70

Last 24 hours

[More Graphs](#)

Water Level Observation Network
Owned and maintained by:
[NOAA's National Ocean Service](#)

Data provided by the [National Data Buoy Center](#)

More Graphs >>

Google Earth 5 - WebKit Browser

Google Earth EC
File Edit View Tools Add Help
brown street, ann arbor mi

Ocean Observations

Recent Observations -- Springmaid Pier, SC

Parameter	Unit	Y-axis Range	X-axis Range
Air temperature	Degrees C	-4.00 to 3.50	2:00 AM EST 3/03 to 2:00 AM EST 3/04
Water temperature	Degrees C	9.40 to 10.00	2:00 AM EST 3/03 to 2:00 AM EST 3/04
Wind gust speed	Meters/Second	1.50 to 9.30	2:00 AM EST 3/03 to 2:00 AM EST 3/04
Wind speed	Meters/Second	1.50 to 6.20	2:00 AM EST 3/03 to 2:00 AM EST 3/04

Units: [English](#) | Metric
[Back to Current Conditions](#)

Data provided by the [National Data Buoy Center](#)

`Back to Current Conditions »`

Google Earth 5 - WebKit Browser

Google Earth EC

File Edit View Tools Add Help

4 brown street, ann arbor mi

Ocean Observations

Recent Conditions -- Springmaid Pier, SC

Air temperature: 0.0 °C (32.0 °F)
Pressure Tendency: +0.0 hPa (0.0 in)
Sea level pressure: 1030.8 hPa (30.4 in)
Water temperature: 9.5 °C (49.3 °F)
Wind direction: 10 °True (N)
Wind gust speed: 5.7 m/s (11.1 kts)
Wind speed: 4.6 m/s (8.9 kts)
Last reported: 6:00 AM GMT 03/04/2009
1:00 AM EST 03/04/2009

Air temperature (Degrees F)

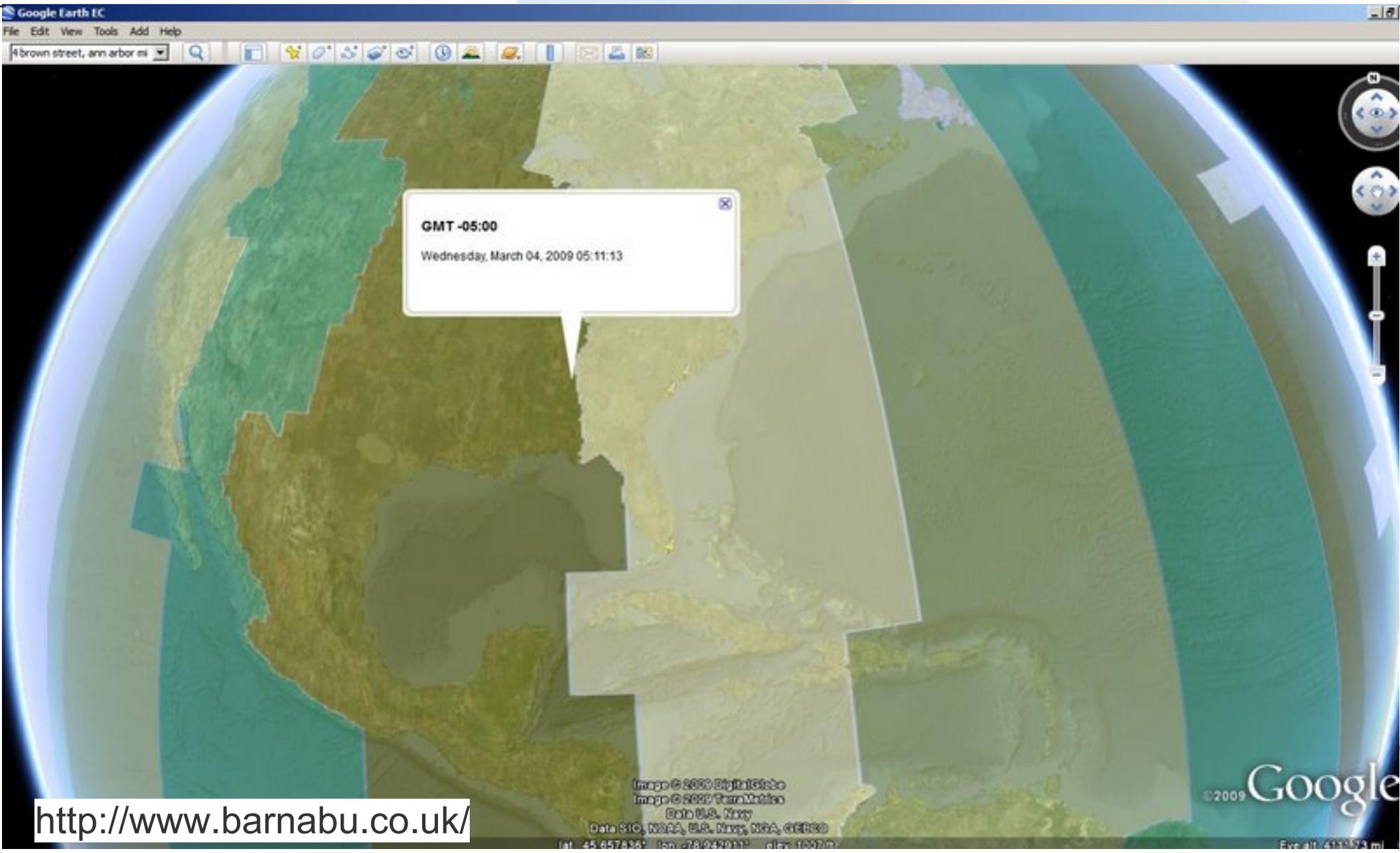
Last 24 hours
[More Graphs](#)

Water Level Observation Network
Owned and maintained by:
[NOAA's National Ocean Service](#)

Data provided by the [National Data Buoy Center](#)

More Graphs >>

Google Earth 5 - WebKit Browser

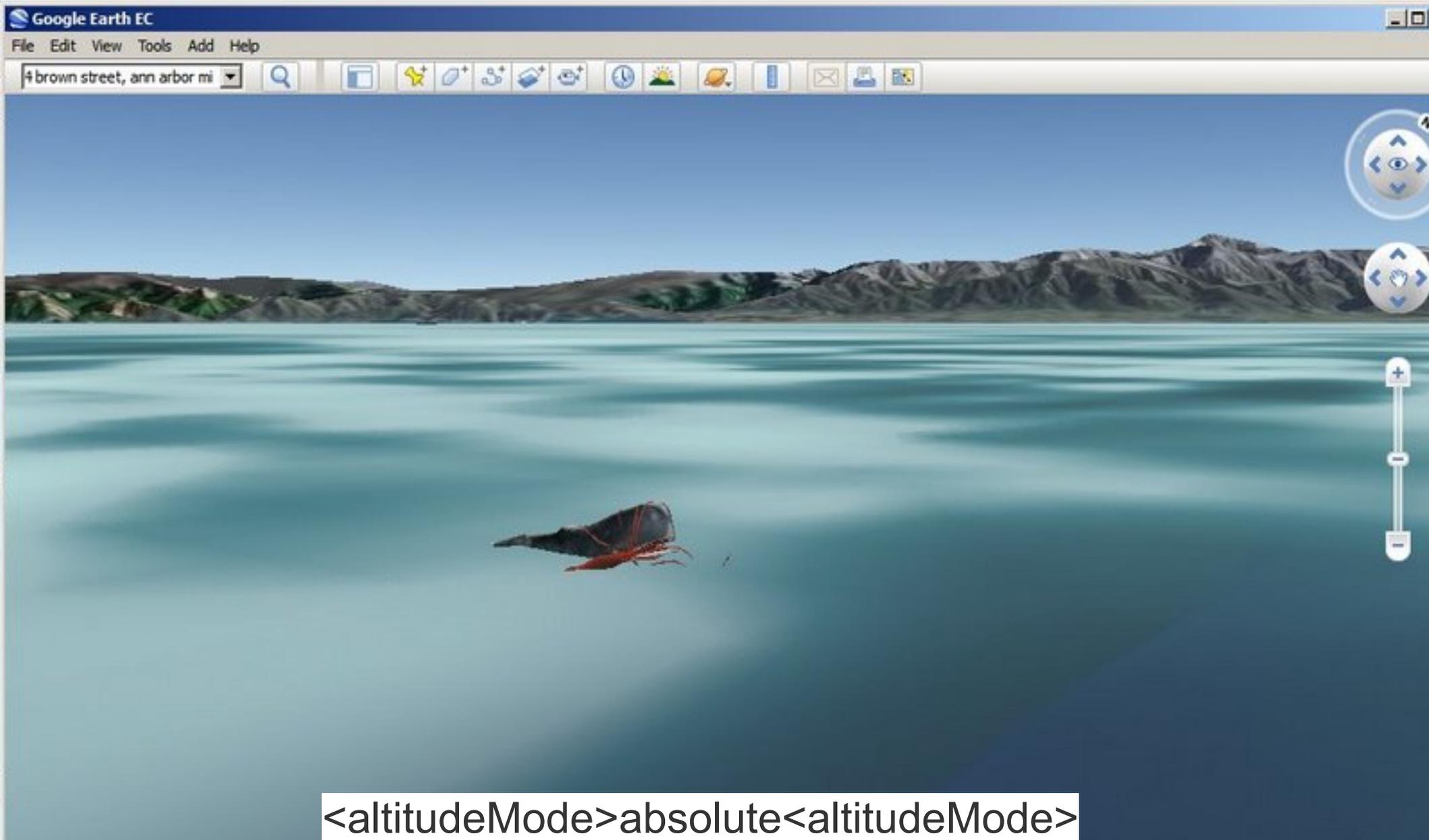


<http://www.barnabu.co.uk/>

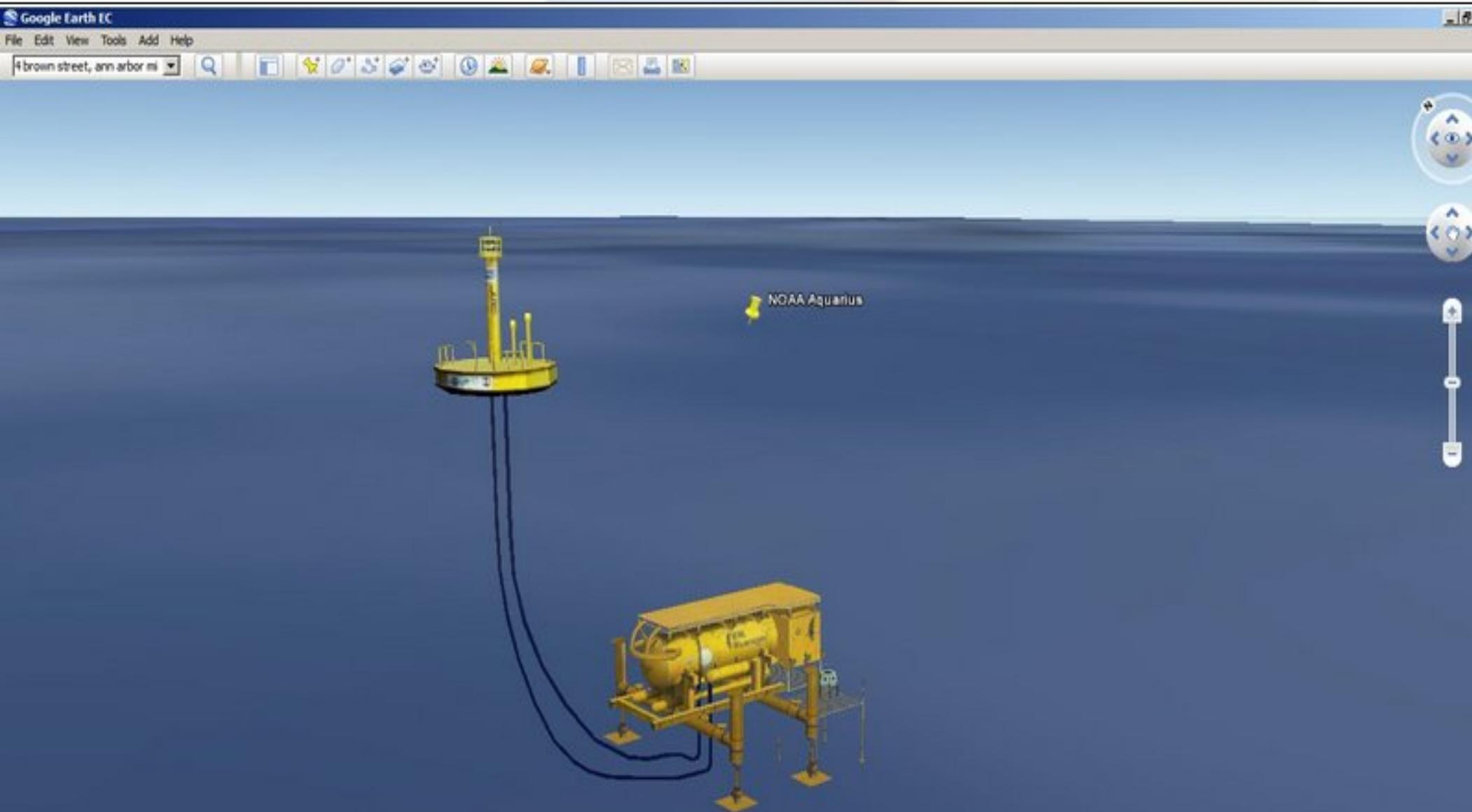
Google Earth 5 - AltitudeMode

```
<Placemark>
<name>Relative to sea floor: 4m</name>
<Point>          <gx:
altitudeMode>relativeToSeaFloor</gx:altitudeMode>
  <coordinates>
    -122.5909986451928,37.74528656192857,4
  </coordinates>
</Point></Placemark>
```

Google Earth 5 - AltitudeMode

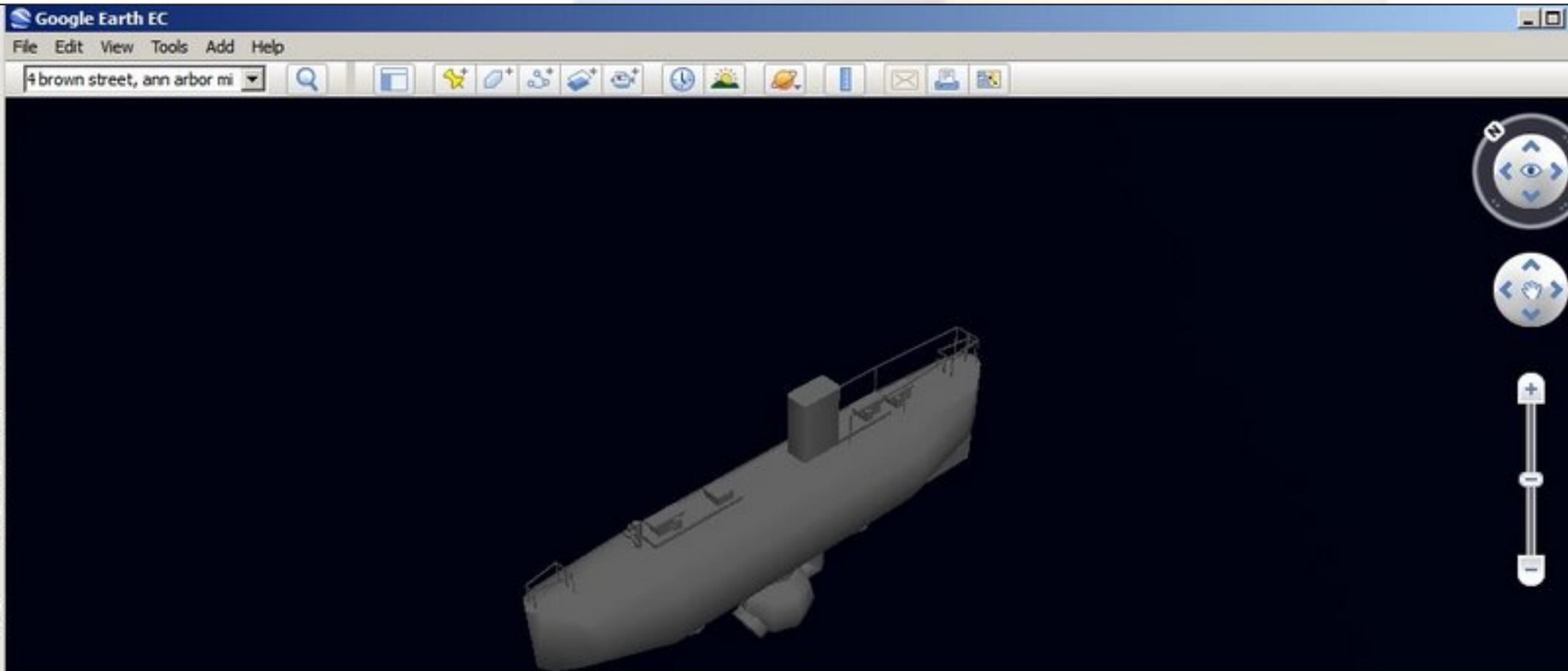


Google Earth 5 - AltitudeMode



```
<gx:altitudeMode>clampToSeaFloor</gx:altitudeMode>
```

Google Earth 5 - AltitudeMode



```
<gx:altitudeMode>relativeToSeaFloor</gx:altitudeMode>
```

Google Earth 5 - Touring

```
<gx:Tour>  
  <name>Observing Assets</name>  
  <description>NOAA Observing Assets on the Gulf  
Coast</description>  
  <gx:Playlist>  
    <!-- any number of gx:TourPrimitive elements -->  
  </gx:Playlist>  
</gx:Tour>
```

Google Earth 5 - Touring

Google Earth 5 interface showing a satellite view of the ocean. A white shark tag profile is displayed in the foreground. The profile includes the following information:

- Global Tagging of Pelagic Predators (GTOPP)**
- White shark**
- Tagging Data**
- Animal Facts**
- Tag Facts**
- Swim with me:** Quickly, Slowly
- Where I went:** Download track
- Depth Profile:** 0m to -900m
- About me:**
 - Tag Number: 4009
 - Gender: female
 - Length: 400cm
 - Weight: N/A
- Credits:**
 - data courtesy of TOPP; tagged shark photograph © Scot Anderson; underwater shark photograph and tag photograph © Jason Bradley; video courtesy of Rick Rosenthal; species map courtesy AquaMaps

Image © 2009 DigitalGlobe

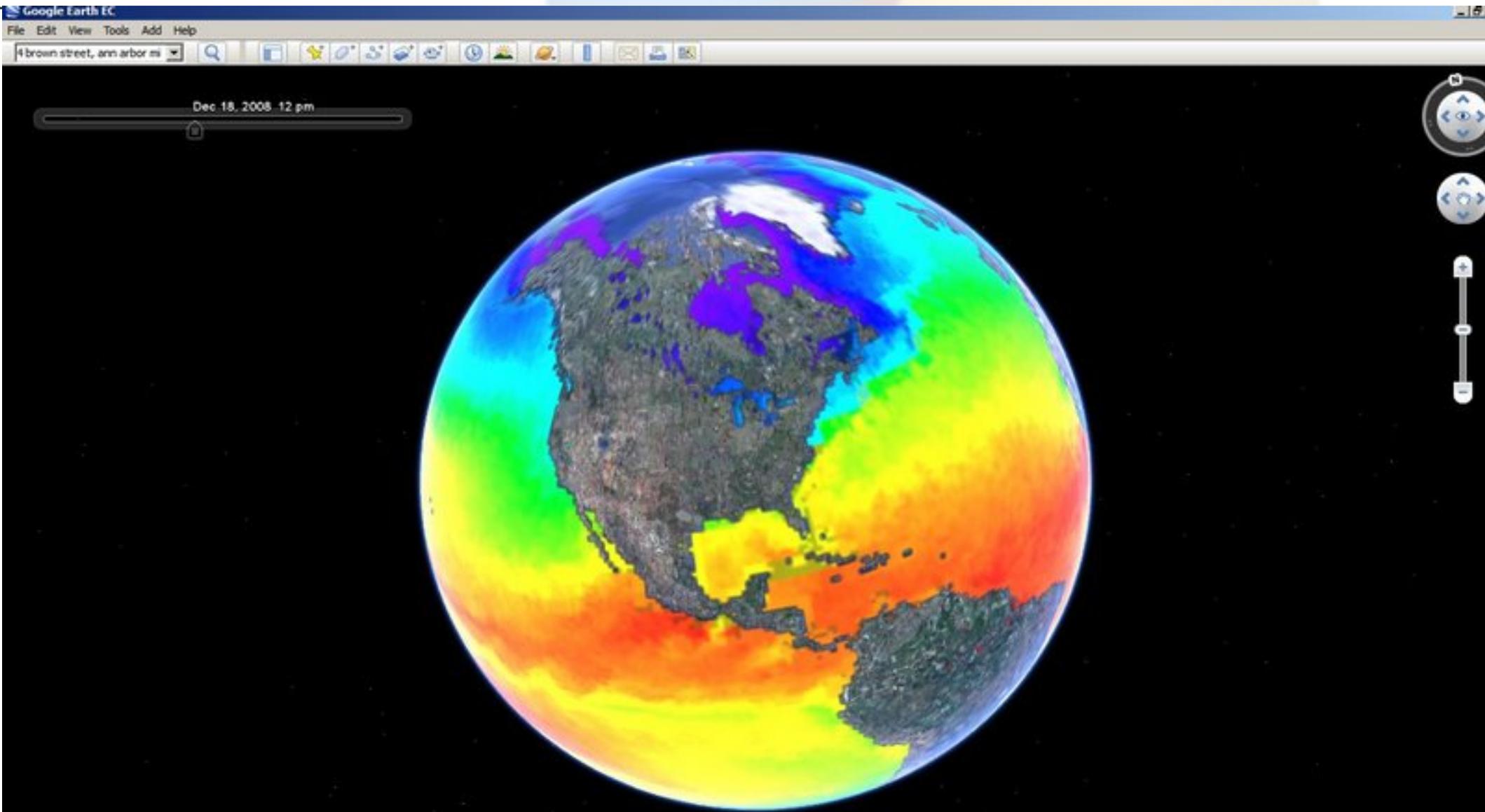
Data U.S. Navy
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Lat: 37.313260° Lon: -122.937592° elev: -1704 ft

©2009 Google

Eye alt: 125.01 mi

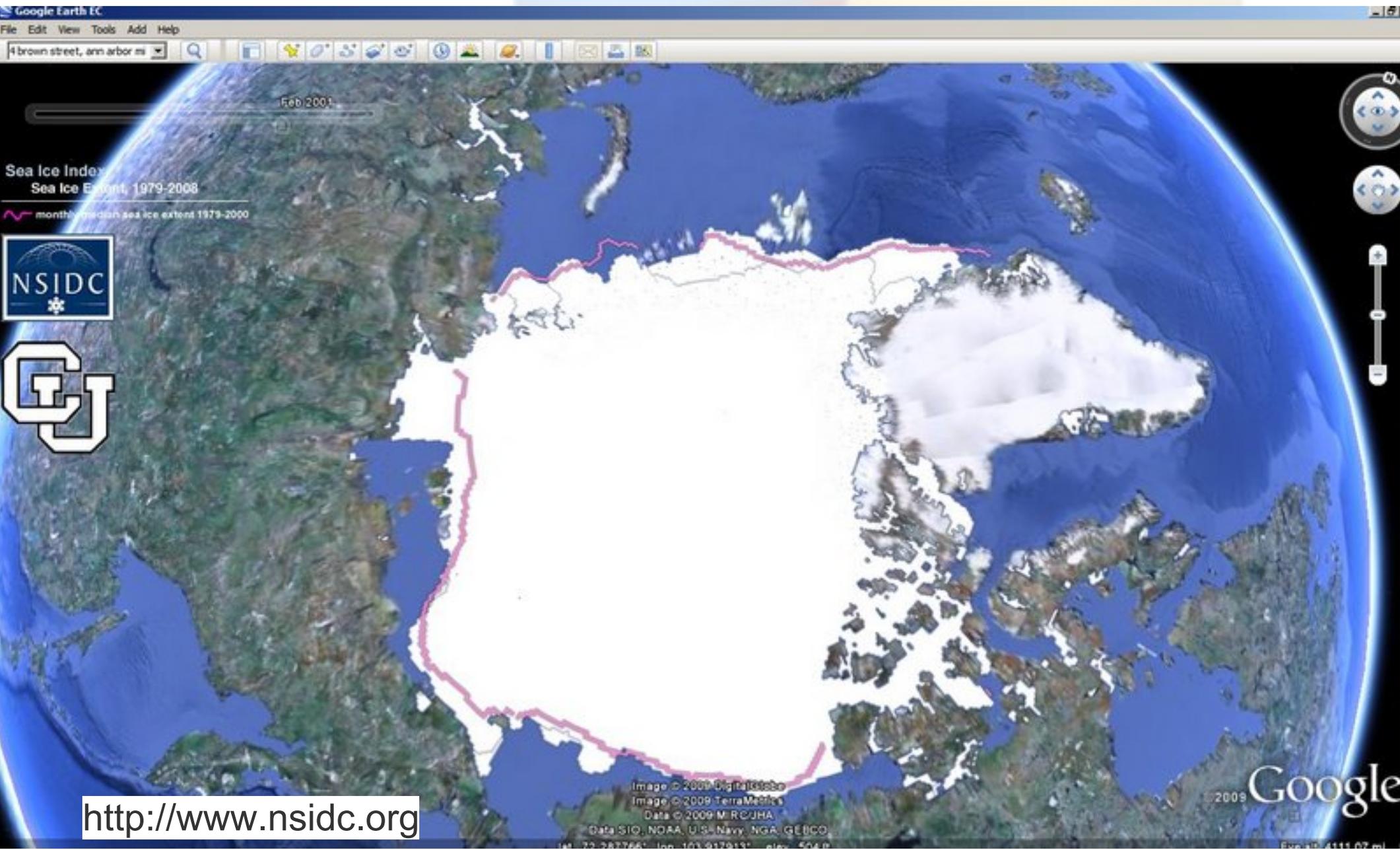
<http://www.gtopp.org/>

Google Earth 5 - TimeStamp



```
<gx:TimeStamp><when>2008-12-18T05:00:00-08:00</when></gx:TimeStamp>
```

Google Earth 5 - TimeStamp

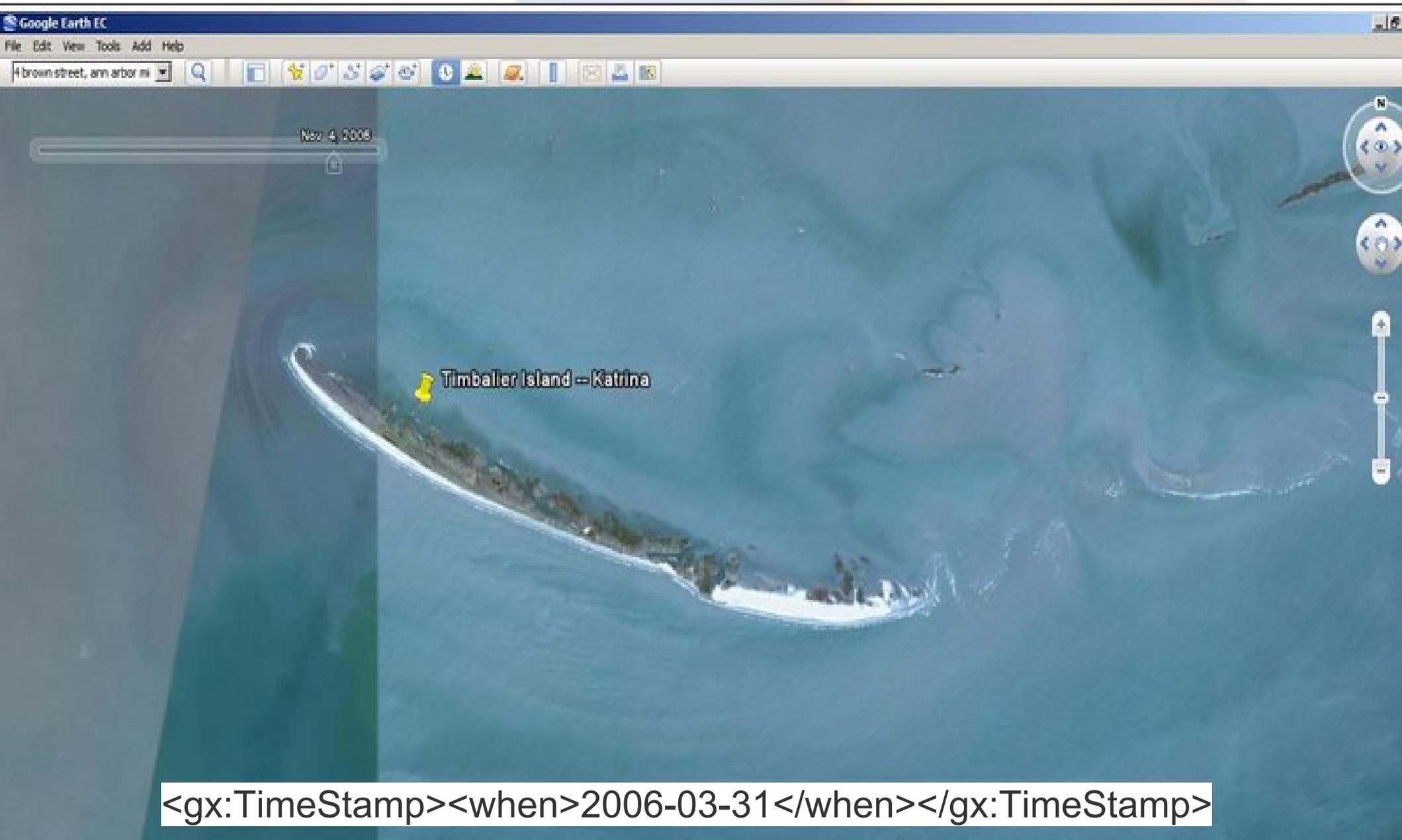


Google Earth 5 - TimeStamp

```
<Placemark>
  <name>Katrina Imagery</name>
  <LookAt>
    <gx:TimeStamp>
      <when>2006-03-31</when>
    </gx:TimeStamp>
    <longitude>-90.52527732256147</longitude>
    <latitude>29.08409752705276</latitude>
  </LookAt>
  <Point>   <coordinates>-90.525277,29.0840975,0
</coordinates>
  </Point>
</Placemark>
```



Google Earth 5 - TimeStamp



See Also:



KML Documentation

<http://code.google.com/apis/kml/documentation>

KML Developers Guide

<http://code.google.com/apis/kml/documentation/topicsinkml.html>

Google Earth Outreach

<http://earth.google.com/outreach>

Google Charts API

<http://code.google.com/apis/chart>



Questions:



Pete Giencke
giencke@google.com

Steve Miller
smiller@google.com

